CLAIMS

1. A positive electrode for a non-aqueous electrolyte primary battery, characterized in that at least one metal oxide selected from the group consisting of titanium oxide, alumina, zinc oxide, chromium oxide, lithium oxide, nickel oxide, copper oxide and iron oxide is dispersed between particles of manganese dioxide.

2. A positive electrode for a non-aqueous electrolyte primary battery according to claim 1, wherein the metal oxide is titanium dioxide.

3. A positive electrode for a non-aqueous electrolyte primary battery according to claim 1 or 2, wherein a mass of the metal oxide is 0.5% to 4% of a mass of manganese dioxide.

4. A method of producing a positive electrode for a non-aqueous electrolyte primary battery which comprises the steps of:

(I) a step of producing a mixed solution by adding manganese dioxide and an alkoxide of at least one metal selected from the group consisting of titanium, aluminum, zinc, chromium, lithium, nickel, copper and iron to an organic solvent and mixing them;

(II) a step of adding water to the mixed solution to produce a metal hydroxide;

(III) a step of changing the resulting metal hydroxide into a metal oxide by heating and drying a solution containing the metal hydroxide and dispersing the metal oxide between particles of manganese dioxide to produce powder for a positive electrode; and

(IV) a step of shaping the powder for a positive electrode to produce a positive electrode.

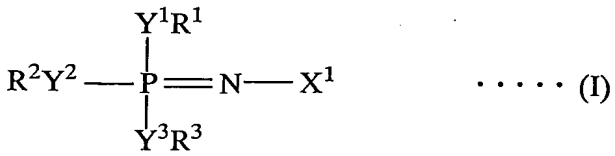
5. A method of producing a positive electrode for a non-aqueous electrolyte primary battery according to claim 4, wherein the metal is titanium.

6. A method of producing a positive electrode for a non-aqueous electrolyte primary battery according to claim 4, wherein the alkoxide of the metal is titanium isopropoxide ($Ti[OCH(CH_3)_2]_4$).

7. A non-aqueous electrolyte primary battery comprising a positive electrode as described in any one of claims 1 to 3, a negative electrode, and an electrolyte comprising an aprotic organic solvent and a support salt.

8. A non-aqueous electrolyte primary battery according to claim 7, wherein the aprotic organic solvent is added with a phosphazene derivative and/or an isomer of the phosphazene derivative.

9. A non-aqueous electrolyte primary battery according to claim 8, wherein the phosphazene derivative has a viscosity at 25°C of not more than 300 mPa·s (300 cP) and is represented by the following formula (I) or (II):



$$R^2Y^2-\underset{\displaystyle Y^3R^3}{\overset{\displaystyle Y^1R^1}{\overset{|}{\underset{|}{P}}}}=N-X^1 \qquad \cdots\cdots \text{(I)}$$

(wherein R^1, R^2 and R^3 are independently a monovalent substituent or a halogen element; X^1 is an organic group containing at least one element selected from the group consisting of carbon, silicon, germanium, tin, nitrogen, phosphorus, arsenic, antimony, bismuth, oxygen, sulfur, selenium, tellurium and polonium; and Y^1, Y^2 and Y^3 are independently a bivalent connecting group, a bivalent element or a single bond)

$$(NPR^4{}_2)_n \qquad \cdots\cdots \text{(II)}$$

(wherein R^4 is independently a monovalent substituent or a halogen element; and n is 3 to 15).

10. A non-aqueous electrolyte primary battery according to claim 9, wherein the phosphazene derivative of the formula (II) is represented by the following formula (III):

$$(NPF_2)_n \qquad \cdots\cdots \text{(III)}$$

(wherein n is 3 to 13).

11. A non-aqueous electrolyte primary battery according to claim 9, wherein the phosphazene derivative of the formula (II) is represented by the following formula (IV):

$$(NPR^5{}_2)_n \qquad \cdots\cdots \text{(IV)}$$

(wherein R^5 is independently a monovalent substituent or fluorine and at least one of R^5s is a fluorine-containing monovalent substituent or fluorine, and n is 3 to 8, provided that all of R^5s are not fluorine).

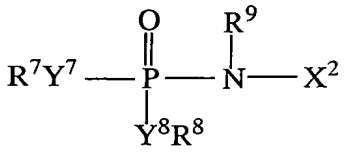
12. A non-aqueous electrolyte primary battery according to claim 8, wherein the phosphazene derivative is solid at 25°C and is represented by the

following formula (V):

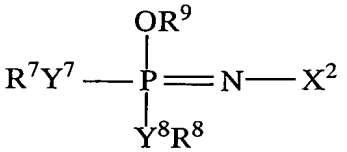
$(NPR^6{}_2)_n$ ····· (V)

(wherein R^6 is independently a monovalent substituent or a halogen element; and n is 3 to 6).

13. A non-aqueous electrolyte primary battery according to claim 8, wherein the isomer is represented by the following formula (VI) and is an isomer of a phosphazene derivative represented by the following formula (VII):



····· (VI)



····· (VII)

(in the formulae (VI) and (VII), R^7, R^8 and R^9 are independently a monovalent substituent or a halogen element; X^2 is a substituent containing at least one element selected from the group consisting of carbon, silicon, germanium, tin, nitrogen, phosphorus, arsenic, antimony, bismuth, oxygen, sulfur, selenium, tellurium and polonium; and Y^7 and Y^8 are independently a bivalent connecting group, a bivalent element or a single bond).

14. A positive electrode for a non-aqueous electrolyte secondary battery, characterized in that at least one metal oxide selected from the group consisting of titanium oxide, alumina, zinc oxide, chromium oxide, lithium oxide, nickel oxide, copper oxide and iron oxide is dispersed between particles of at least one lithium-containing composite oxide selected from the group consisting of $LiCoO_2$, $LiNiO_2$ and $LiMn_2O_4$.

15. A positive electrode for a non-aqueous electrolyte secondary battery according to claim 14, wherein the metal oxide is titanium oxide.

16. A positive electrode for a non-aqueous electrolyte secondary battery according to claim 14 or 15, wherein a mass of the metal oxide is 0.5% to 4% of a mass of the lithium-containing composite oxide.

17. A method of producing a positive electrode for a non-aqueous electrolyte secondary battery, which comprises the steps of:

(I) a step of producing a mixed solution by adding at least one lithium-containing composite oxide selected from the group consisting of $LiCoO_2$, $LiNiO_2$ and $LiMn_2O_4$ and an alkoxide of at least one metal selected from the group consisting of titanium, aluminum, zinc, chromium, lithium, nickel, copper and iron to an organic solvent and mixing them;

(II) a step of adding water to the mixed solution to produce a metal hydroxide;

(III) a step of changing the resulting metal hydroxide into a metal oxide by heating and drying a solution containing the metal hydroxide and dispersing the metal oxide between particles of manganese dioxide to produce powder for a positive electrode; and

(IV) a step of shaping the powder for a positive electrode to produce a positive electrode.

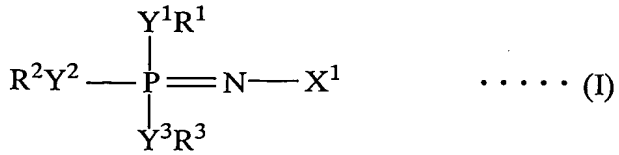
18. A method of producing a positive electrode for a non-aqueous electrolyte secondary battery according to claim 17, wherein the metal is titanium.

19. A method of producing a positive electrode for a non-aqueous electrolyte secondary battery according to claim 17, wherein the alkoxide of the metal is titanium isopropoxide ($Ti[OCH(CH_3)_2]_4$).

20. A non-aqueous electrolyte secondary battery comprising a positive electrode as described in any one of claims 14 to 16, a negative electrode, and an electrolyte comprising an aprotic organic solvent and a support salt.

21. A non-aqueous electrolyte secondary battery according to claim 20, wherein the aprotic organic solvent is added with a phosphazene derivative and/or an isomer of the phosphazene derivative.

22. A non-aqueous electrolyte secondary battery according to claim 21, wherein the phosphazene derivative has a viscosity at 25°C of not more than 300 mPa·s (300 cP) and is represented by the following formula (I) or (II):



$$\cdots\cdots (I)$$

(wherein R^1, R^2 and R^3 are independently a monovalent substituent or a halogen element; X^1 is an organic group containing at least one element selected from the

group consisting of carbon, silicon, germanium, tin, nitrogen, phosphorus, arsenic, antimony, bismuth, oxygen, sulfur, selenium, tellurium and polonium; and Y^1, Y^2 and Y^3 are independently a bivalent connecting group, a bivalent element or a single bond)

$$(NPR^4_2)_n \quad \cdots\cdots \text{(II)}$$

(wherein R^4 is independently a monovalent substituent or a halogen element; and n is 3 to 15).

23. A non-aqueous electrolyte secondary battery according to claim 22, wherein the phosphazene derivative of the formula (II) is represented by the following formula (III):

$$(NPF_2)_n \quad \cdots\cdots \text{(III)}$$

(wherein n is 3 to 13).

24. A non-aqueous electrolyte secondary battery according to claim 22, wherein the phosphazene derivative of the formula (II) is represented by the following formula (IV):

$$(NPR^5_2)_n \quad \cdots\cdots \text{(IV)}$$

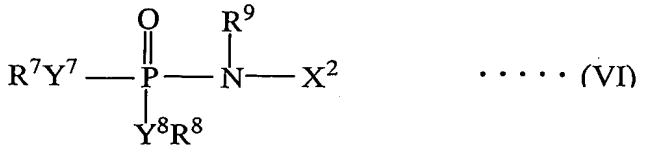
(wherein R^5 is independently a monovalent substituent or fluorine and at least one of R^5s is a fluorine-containing monovalent substituent or fluorine, and n is 3 to 8, provided that all of R^5s are not fluorine).

25. A non-aqueous electrolyte secondary battery according to claim 21, wherein the phosphazene derivative is solid at 25°C and is represented by the following formula (V):

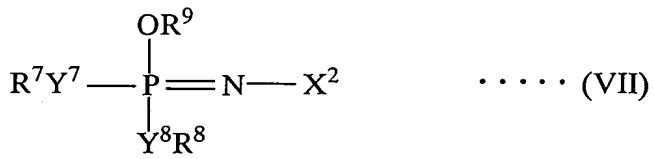
$$(NPR^6_2)_n \quad \cdots\cdots \text{(V)}$$

(wherein R^6 is independently a monovalent substituent or a halogen element; and n is 3 to 6).

26. A non-aqueous electrolyte secondary battery according to claim 21, wherein the isomer is represented by the following formula (VI) and is an isomer of a phosphazene derivative represented by the following formula (VII):



$$\cdots\cdots \text{(VI)}$$



$$R^7Y^7-\underset{\displaystyle Y^8R^8}{\overset{\displaystyle OR^9}{\overset{|}{\underset{|}{P}}}}=N-X^2 \qquad \cdots\cdots \text{(VII)}$$

(in the formulae (VI) and (VII), R^7, R^8 and R^9 are independently a monovalent substituent or a halogen element; X^2 is a substituent containing at least one element selected from the group consisting of carbon, silicon, germanium, tin, nitrogen, phosphorus, arsenic, antimony, bismuth, oxygen, sulfur, selenium, tellurium and polonium; and Y^7 and Y^8 are independently a bivalent connecting group, a bivalent element or a single bond).